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Award Number: DAMD17-99-2-9003

TITLE: UH Telemedicine Proposal

PRINCIPAL INVESTIGATOR: Richard B. Friedman, M.D.

CONTRACTING ORGANIZATION: University of Hawaii
Honolulu, Hawaii 96822

REPORT DATE: June 2001

TYPE OF REPORT: Final

PREPARED FOR: U.S. Army Medical Research and Materiel Command
Fort Detrick, Maryland 21702-5012

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6. AUTHOR(S) Richard B. Friedman, M.D.				
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) University of Hawaii Honolulu, Hawaii 96822 E-Mail: rfriedman@queens.org			8. PERFORMING ORGANIZATION REPORT NUMBER	
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12a. DISTRIBUTION / AVAILABILITY STATEMENT Approved for Public Release; Distribution Unlimited				12b. DISTRIBUTION CODE
13. ABSTRACT (Maximum 200 Words) The purpose of the University of Hawaii Telemedicine Project (UHTP) is to assess and establish an effective telemedicine curriculum uniquely tailored for the training of military healthcare personnel. To accomplish this task, a clinical telemedicine service was established such that a hub of physician specialists in Honolulu is available to primary care providers and patients in rural and/or remote clinics; and from this experience a web-based educational curriculum to teach military and other health care providers how to use telemedicine was designed. This Project was supported by a two-year Cooperative Agreement between the University of Hawaii John A. Burns School of Medicine (JABSOM) and the Department of Defense, United States Army Medical Research Acquisition Activity, Telemedicine and Advanced Technology Research Center (TATRC). Modules 1-6 have been posted to a public web server on the University of Hawaii network to host the Telemedicine Curriculum at http://www.uhtelemed.hawaii.edu/curriculum .				
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INTRODUCTION

The purpose of the University of Hawaii Telemedicine Curriculum Research Project is to assess and establish an effective telemedicine curriculum uniquely tailored for the training of military healthcare personnel. To accomplish this task, a clinical telemedicine service was established such that a hub of physician specialists in Honolulu is available to primary care providers and patients in rural and/or remote clinics; and from this clinical experience a web-based educational curriculum has been developed to teach military and other health care providers how to use telemedicine. This Project was supported by a two-year Cooperative Agreement between the University of Hawaii John A. Burns School of Medicine and the Department of Defense, United States Army Medical Research Acquisition Activity, Telemedicine and Advanced Technology Research Center. The second year has focused primarily on the design and production of the curriculum modules. The curriculum is web-based and designed to accommodate individualized distance learning for Department of Defense and other health care providers. The curriculum modules provide high-quality, accessible, cost-effective training in how to use telemedicine as a tool to extend optimal medical care over geographic distances. At the conclusion of Year 2, the Project is on schedule and within budget.

BODY

HISTORICAL PERSPECTIVE AND PAST PROGRESS:

The original hypothesis for this Project is that Department of Defense health care providers will benefit from accessible curriculum for training in the use of telemedicine. The approved Statement of Work specified the completion of two research tasks within Year 1 of the University of Hawaii Project:

- (1) a comprehensive telemedicine Needs Assessment conducted within a Department of Defense facility; and
- (2) Educational Effectiveness Methodologies for a web-based curriculum.

These deliverables were submitted to the Telemedicine and Advanced Technology Research Center on schedule.

Under the terms of the Cooperative Agreement, Year 1 activities included implementation of communications networks suitable to support the clinical telemedicine activities that would provide a foundation for the curriculum design. The Queen Emma Clinic in Honolulu serves as the Project hub, where a variety of specialist physicians are available for remote consults to primary care clinics in remote/rural areas of the Hawaiian Islands. Implementation and physician-training was successfully completed.

Outcomes of Year 1 of the University of Hawaii Telemedicine Curriculum Research Project included four manuscripts. Two of these manuscripts were deliverables specified in the approved

Statement of Work of the Project Cooperative Agreement. The remaining two manuscripts emanated from active research and were submitted to professional journals.

The research completed during Year 1 of the University of Hawaii Telemedicine Project is significant in that it permitted optimal design of a functional curriculum in Year 2. The Needs Assessment revealed what the content of the five web-based modules should be; the Educational Effectiveness Methodologies presented a framework for web-based learning.

KEY RESEARCH ACCOMPLISHMENTS:

A. Telemedicine Curriculum Development:

- 1) Completed and posted Curriculum Modules 1-6 to public web server for evaluation and feedback by advisory boards, TATRC staff, and all interested parties.
- 2) Established public web server on the University of Hawaii network to host the Telemedicine Curriculum at <http://www.uhtelemed.hawaii.edu/curriculum>.

B. Clinical Telemedicine Service Network:

- 1) Trained multiple (40-50) residents, attending physicians, consultant physicians and staff members in use of telemedicine equipment. Physicians primarily located at Queen's Medical Center, Queen Emma Clinic, Kapiolani Women and Children's Hospital, and VA Medical Center.
- 2) Developed multiple remote/rural sites as potential participants in UH Telemedicine consult service. Sites include Community Health Centers (remote CHCs in Hawaii), General Hospitals (e.g. Molokai, Hilo), and Pacific Island hospitals/clinics.

- 3) Began conducting routine consultations from remote sites (e.g. diabetes case management by Dr. Joseph Humphry at Hana CHC).

C. Distance Education/Learning:

- 1) Broadcasts weekly UH School of Medicine Grand Rounds to over twenty potential sites in Hawaii and the Pacific using infrastructure jointly provided by the UHTP and the STAN network (TIP-G).
- 2) Provide technical assistance and support to multiple sites including UH School of Medicine, AHEC, and STAN network projects.
- 3) Published several articles on UHTP in Pacific Newsbytes.
- 4) Made presentations in the following meetings/conferences: 2000 and 2001 Annual ATA Conferences, Internet 2 Learn Summit, Pacific Telecommunications Conference 2000, Telecon 2000 Conference, and local ATA chapter symposiums.

For additional details, please see Quarterly Progress Reports included under appendices 1-6 at end of this Annual Report.

REPORTABLE OUTCOMES:

- First release of six Curriculum Modules posted to UHTP public web server (www.uhtelemed.hawaii.edu/curriculum) for review and comments (comments should be sent to: uhtelemedicine@hawaii.rr.com).
- 2001 Annual American Telemedicine Association (ATA) conference presentations included:
 - Poster by Dr. Stan Saiki titled "Training Telemedicine Consultants",
 - Poster by Dr. David Bangert titled "Best Practices for High Utilization of Telemedicine",

- Concurrent Session presentation by Dr. Sharee Pepper titled "A Web-Based Telemedicine Curriculum",
- Dr. Pepper demonstrated the UHTP Curriculum Modules on Monday and Tuesday (June 3 & 4) in the TATRC display area.

The two year renewal UHTP grant was submitted, reviewed, revised and the Assistance Agreement received for the cooperative agreement with the US. Army Medical Research Acquisition Activity (USAMRAA).

CONCLUSIONS

Considerable progress was made during the second annual reporting period of the UH Telemedicine Project cooperative agreement.

The anticipated five modules have been posted to the web and can be revised and upgraded in response to feedback from interested parties as appropriate. A sixth module, which is an example of applied telemedicine to balance assessment and audiology, has also been included in this web-based curriculum. These curriculum modules are currently housed on a UHTP server at the University of Hawaii and can be easily moved to any host organization deemed appropriate by USAMRMC/ TATRC, as the contracting agency.

A network of rural/remote Community Health Centers (CHCs) has been established that can now communicate by video teleconferencing (VTC) with physicians and medical specialists located in Honolulu, such as Queens Hospital, Queen Emma Clinics, or the VA. Lessons have been learned

about the types of telemedicine services which are the most likely to succeed in many of these underserved environments. Focused applications provided by specialized physician consultants are proving to be very effective. For example, weekly diabetic case management consults with Hana CHC are being conducted by Dr. Joseph Humphry and similar programs are anticipated in other CHCs.

The UH Telemedicine Project has been instrumental in bridging a variety of separate video conference and data networks in Hawaii. These linkages have enabled weekly broadcasts of the UH School of Medicine Grand Rounds to over twenty potential sites in Hawaii and throughout the Pacific. It is anticipated that these shared networks and linkages will continue to grow and provide increased distance learning opportunities for medical education, training, and mentoring in Hawaii and the Pacific Islands.

The first two years of this cooperative agreement have established a solid foundation on which to build future UH Telemedicine Projects. The UH Telemedicine Project has received renewal funding approval for the next two years and is anticipating a continued and productive relationship with the US Army Medical Research and Materiel Command.

APPENDICES

FIFTH QUARTER REPORT
(November, 1999 – January, 2000)

Quarterly Report

1. Agreement No. DAMD17-99-2-9003 2. Report Date February 14, 2000
3. Reporting period from November 1, 1999 to January 31, 2000
4. PI Richard B. Friedman, M.D. 5. Telephone No. (808) 551-0734
6. Institution University of Hawaii, Office of Research Services
2350 Dole Street, Sakamaki D-200, Honolulu, Hawaii 96822
7. Project Title: University of Hawaii Telemedicine Curriculum Project
8. Current staff, with percent effort of each on project. **SEE ATTACHED**
9. Agreement expenditures to date (as applicable):

	<u>This Qtr / Cumulative</u>		<u>This Qtr / Cumulative</u>
Personnel	\$100,679.10 / \$382,578.72	Travel	\$ 3,139.66 / \$ 10,988.61
Fringe Benefits	\$ 19,669.53 / \$ 64,452.56	Equipment	\$ 34,390.90 / \$165,043.64
Supplies	\$ 25,935.60 / \$ 59,322.25	Other	\$ 82,004.30 / \$ 1,447,067.94
	<u>This Qtr / Cumulative</u>		
	Subtotal		\$265,819.09 / \$2,129,453.60
	Indirect Costs		\$ 44,663.69 / \$ 124,370.25
	Total:		\$310,482.78 / \$2,253,823.97

10. Comments on administrative and logistical matters.

University of Hawaii serves as fiduciary agency for this Cooperative Agreement. All activities. Consequently, expenditures and activities are governed by University of Hawaii policies and procedures as per the Office of Research Services and School of Medicine Administrative Services Fiscal Office.

11. Use additional page(s), as necessary, to describe scientific progress for the quarter in terms of the tasks or objectives listed in the statement of work for this agreement. Explain deviations where this isn't possible. Include date where possible. **SEE ATTACHED**

12. Use additional page(s) to present a brief statement of plans or milestones for the next quarter.
SEE ATTACHED

I certify to the best of my knowledge and belief that this report is true in all respects and that all disbursements have been made for the purpose and conditions of the grant or agreement.

Item #8: Current Staff**5th Quarter, November, 1999 – January, 2000**

Responsibility	Individual	FTE	Effective
Principal Investigator	Richard Friedman, M.D.	20%	04/01/99
Associate Project Director	Stanley Saiki, M.D.	50%	02/01/99
Project Manager	Jana Hall, Ph.D.,M.B.A.	100%	01/04/99
Administrative Secretary	Irene Tanaka	100%	05/26/99
Administrative Officer (Fiscal)	Susan Iwanaga, B.B.A.	100%	04/01/99
Chief Technical Officer	David Huhta, M.B.A.	100%	06/21/99
Systems Programmer	Mike von Platen	100%	08/02/99
Director, Telemed Learning Lab	Dan Davis, M.D.	10%	02/01/99
Curriculum Assessment & Eval	David C. Bangert, Ph.D.	40%	11/01/98
Curriculum Assessment & Eval	Robert Doktor, Ph.D.	30%	01/01/99
Associate Director (Audiology)	James Yates, Ph.D.	50%	01/01/00
Audiologist	Kathleen Campbell	100%	01/01/00

Item #11: Description of Progress (November, 1999– January, 2000)

Personnel:

- Dr. James Yates, Chairman of University of Hawaii School of Medicine Department of Speech Pathology and Audiology joined UH Telemedicine Project as Associate Director, per Cooperative Agreement specifications.
- Ms. Kathleen Campbell joined UH Telemedicine Project as Audiologist per Cooperative Agreement specifications for remote Balance Assessment and Hearing Screening components.

Activities:

- Submitted Annual Report to U.S. Army Medical Research and Materiel Command, Attn. MCMR-RMI-S.
- Revised Telemedicine Needs Assessment to include data from military health care facilities per recommendation of Dr. Greg Mogel, Dr. Ron Poropatich, Dr. Rufus Sessions (enclosed).
- Began intensive work on educational curriculum modules as per recommendations of completed Needs Assessment: content, web design, production.
- Responded to request from The White House Office of Science & Technology to summarize established resources in Hawaii for how telemedicine serves as a point of intersection between technology and healthcare, and how telemedicine might serve as an export product to China.
- Responded to request for subject matter expertise from American Samoa Department of Health.
- Provided telemedicine demonstration and subject matter expertise to Hawaii State Primary Care Association, the umbrella organization for eighteen Community Health Centers.
- Provided telemedicine demonstration / subject matter expertise to Information Services staff of Kapiolani Medical Center for Women & Children.
- Presented lecture on University of Hawaii Telemedicine Project to Hawaii State Primary Care Association and Papa Ola Lokahi.
- Developed Molokai General Hospital (remote/rural site) as potential participant in UH Telemedicine consult service; implementation in process.
- Initiated expansion of UH Telemedicine Project clinical network to include Department of Veterans Affairs physicians as specialist consultants for remote/rural sites.

- Initiated site assessment for implementing telemedicine from remote community-based Department of Veterans Affairs outpatient clinic in Hilo (remote/rural site)
- Trained 18 residents / attending physicians, 8 consultant physicians and 6 staff members in use of telemedicine equipment.
- Launched Audiology component of UH Telemedicine Project which demonstrates balance assessment and hearing screening over distance. Equipment received, calibrated, staff trained, first patient seen.
- Conducted first consultation from remote site (psychiatry consult from Waianae Coast Comprehensive Community Health Center to Queen Emma Clinics).
- Implemented dermatology store/forward consults; two dermatologists trained, resident training in process.
- Extended telemedicine network to Maui Community College (see updated network diagram, enclosed).
- Developed prototype tele-cardiology system; in testing phase.
- Brought online internet protocol-based multi-point conferencing unit and ISDN-to-LAN gateway to facilitate multi-user calls, as well as calls into and out of University of Hawaii Telemedicine Project network.
- Launched broadcasts of Grand Rounds lectures (November 30, 1999); first presentation from University of Hawaii School of Medicine, Department of Medicine, "Health Outcomes of Coronary Revascularization," Todd Seto, M.D.
- Installed fileserver as part of the Local Area Network on campus of Queen's Medical Center, which serves as the repository for all shared files.
- Installed CD towers on University of Hawaii Telemedicine Project local area network; computer provided in order that medical students can access CD-ROM instructional material.
- Added auxiliary end-point training station at University Tower to provide improved access and flexibility in training consulting physicians.
- Completed installation of mobile telemedicine carts to all remote sites.
- Traveled to Washington, D.C. area and met with many military users of telemedicine to include Doctors Bakalar, Poropatich, Faison, Mogel and Sessions.
- Logged Renewal Pre-Proposal on TATRC web site per Major Greg Mogel.

Item #12: Description of Plans for Next Quarter (February – April, 2000)

- Conduct 2-hour video tele-conference with Dr. Greg Mogel and Dr. Rufus Sessions re Project's progress, January 19, 2000.
- Conduct 2-hour teleconference with Dr. Rufus Sessions and Mr. Eric Hanson re web production of curriculum and extent of TATRC support, February 15, 2000.
- Present lecture at Pacific Telecommunications Conference 2000, "Technical and Training Barriers to Implementing a Telemedicine Consultation System in Rural and Underserved Areas."
- Present University of Hawaii Telemedicine Project as a model to Chubu Hospital in Okinawa, Japan, by invitation of the Japan Foreign Ministry.
- Publish article on University of Hawaii Telemedicine Project in Pacific Newsbytes.
- Retain audiology consultant (Dr. Eric Vierre) as per Cooperative Agreement.
- Complete Balance Assessment protocols for remote consults.
- Present broadcast Grand Rounds for University of Hawaii School of Medicine, Department of Medicine on "Remote Balance Assessment of the Dizzy Patient."
- Conduct workshop for physicians, "The Dizzy Patient."
- Begin production of media component of curriculum: video, audio, graphics.
- Hire Clinical Coordinator to assist with training for clinical services and coordination of telemedicine hub site with remote/rural sites.
- Respond to request for information and subject matter expertise about University of Hawaii Telemedicine Project from Technology Special Assistant to the Governor of Hawaii, Mr. Joe Blanco.

SIXTH QUARTER REPORT
(February, 2000 – April, 2000)

Quarterly Report

1. Agreement No. DAMD17-99-2-9003 2. Report Date May 11, 2000
3. Reporting period from February 1, 2000 to April 30, 2000
4. PI Richard B. Friedman, M.D. 5. Telephone No. (808) 551-0734
6. Institution University of Hawaii, Office of Research Services
2350 Dole Street, Sakamaki D-200, Honolulu, Hawaii 96822
7. Project Title: University of Hawaii Telemedicine Curriculum Project
8. Current staff, with percent effort of each on project. **SEE ATTACHED**
9. Agreement expenditures to date (as applicable):

	<u>This Qtr / Cumulative</u>		<u>This Qtr / Cumulative</u>
Personnel	\$117,637.45 / \$500,216.17	Travel	\$ 3,865.42 / \$14,854.03
Fringe Benefits	\$ 22,767.22 / \$ 87,219.78	Equipment	\$55,761.36 / \$220,805.00
Supplies	\$ 14,998.03 / \$ 74,320.28	Other	\$40,841.12 / \$146,307.01
	<u>This Qtr / Cumulative</u>		
	Subtotal		\$255,870.60 / \$1,043,722.27
	Indirect Costs		\$ 43,369.95 / \$ 167,740.20
	Total:		\$299,240.55 / \$1,211,462.47

10. Comments on administrative and logistical matters.

University of Hawaii serves as fiduciary agency for this Cooperative Agreement. Consequently, all expenditures and activities are governed by University of Hawaii policies and procedures as per the Office of Research Services and School of Medicine Administrative Services Fiscal Office.

11. Use additional page(s), as necessary, to describe scientific progress for the quarter in terms of the tasks or objectives listed in the statement of work for this agreement. Explain deviations where this isn't possible. Include date where possible. **SEE ATTACHED**
12. Use additional page(s) to present a brief statement of plans or milestones for the next quarter. **SEE ATTACHED**

I certify to the best of my knowledge and belief that this report is true in all respects and that all disbursements have been made for the purpose and conditions of the grant or agreement.

Responsibility	Individual	FTE	Effective
Principal Investigator	Richard Friedman, M.D.	20%	04/01/99
Associate Project Director	Stanley Saiki, M.D.	50%	02/01/99
Project Manager	Jana Hall, Ph.D.	100%	01/04/99
Administrative Secretary	Irene Tanaka	100%	05/26/99
Administrative Officer (Fiscal)	Susan Iwanaga, B.B.A.	100%	04/01/99
Chief Technical Officer	David Huhta	100%	06/21/99
Systems Programmer	Mike von Platen	100%	08/02/99
Director, Telemed Learning Lab	Dan Davis, M.D.	10%	02/01/99
Curriculum Assessment & Eval	David C. Bangert, Ph.D.	40%	11/01/98
Curriculum Assessment & Eval	Robert Doktor, Ph.D.	30%	01/01/99
Associate Director (Audiology)	James Yates, Ph.D.	50%	05/16/00
Audiologist	Kathleen Campbell	100%	01/01/00
Telemedicine Clinic Coordinator	RaeAnn Magyar, M.D.	50%	03/13/00

Item #11: Description of Progress (February – April, 2000)

Personnel:

- Shifted reporting relationship from Major Greg Mogel, M.D., to Rufus Sessions, Ph.D., per notification by TATRC.
- Hired RaeAnn Magyar, M.D., (.5FTE) as Telemedicine Clinical Coordinator; responsibilities include training physicians/staff at hub and spoke sites, increasing telemedicine consults.

Activities:

- Participated in "Internet 2 Learn Summit" with Telemedicine & Advanced Technology Research Center in Fairfax, Virginia, April 26-27.
- Conducted 2-hour video tele-conference with Dr. Greg Mogel and Dr. Rufus Sessions re Project progress.
- Conducted 2-hour teleconference with Dr. Rufus Sessions and Mr. Eric Hanson re web production of curriculum and extent of TATRC support, February 15, 2000.
- Presented lecture at Pacific Telecommunications Conference 2000, "Technical and Training Barriers to Implementing a Telemedicine Consultation System in Rural and Underserved Areas," David Huhta, Chief Technical Officer.
- Presented University of Hawaii Telemedicine Project as a model to Chubu Hospital in Okinawa, Japan, by invitation of the Japan Foreign Ministry.
- Presented University of Hawaii Telemedicine Project to John A. Burns School of Medicine Imi Ho'ola program staff in response to interest in utilizing curriculum for Pacific Basin student recruitment
- Presented broadcast Grand Rounds for University of Hawaii School of Medicine, Department of Medicine on "Diagnosis and Management of the Vertigo Patient," Erik S. Viirre, M.D., Ph.D.
- Continued weekly presentation of Department of Medicine Grand Rounds over network.
- Published article on University of Hawaii Telemedicine Project in Pacific Newsbytes.
- Published article, "UH Med School Participates in Cutting Edge Telehealth Project," Hawaii Healthcare News.
- Retained audiology consultant (Dr. Eric Viirre) as per Cooperative Agreement (module #6).

- Completed Balance Assessment protocols for remote consults.
- Conducted Hawaii Advisory Committee meeting February 14.
- Conducted workshop for physicians, "The Dizzy Patient."
- Completed first draft of curriculum content (six modules).
- Began production of media component of curriculum: video, audio, graphics.
- Hired Clinical Coordinator to assist with training for clinical services and coordination of telemedicine hub site with remote/rural sites.
- Continued training of physicians at hub and remote clinical sites; increasing consult traffic.
- Responded to request for information and subject matter expertise about University of Hawaii Telemedicine Project from Technology Special Assistant to the Governor of Hawaii, Mr. Joe Blanco.
- Planned National Advisory Committee meeting to be held at the American Telemedicine Association Conference in Phoenix, May 2000.
- Extended clinical service network to Hana, Maui, (remote, rural location).

SEVENTH QUARTER REPORT

(May, 2000 – July, 2000)

Quarterly Report

1. Agreement No. DAMD17-99-2-9003 2. Report Date November 21, 2000
3. Reporting period from August 1, 2000 to: October 31, 2000
4. PI Richard B. Friedman, M.D. 5. Telephone No. (808) 528-2938
6. Institution University of Hawaii, Office of Research Services
2350 Dole Street, Sakamaki D-200, Honolulu, Hawaii 96822
7. Project Title: University of Hawaii Telemedicine Curriculum Project
8. Current staff, with percent effort of each on project. **SEE ATTACHED**
9. Agreement expenditures to date (as applicable):

	<u>This Qtr / Cumulative</u>		<u>This Qtr / Cumulative</u>
Personnel	\$153,938.83 / \$654,155.00	Travel	\$ 7,979.01 / \$ 22,833.04
Fringe Benefits	\$ 25,420.76 / \$112,640.54	Equipment	\$ (6,227.25) * / \$214,577.75
Supplies	\$ 22,349.56 / \$ 96,669.84	Other	\$ 54,305.03 / \$200,612.04

* Coding transfer between supplies & equipment categories for expenditures of prior period.

	<u>This Qtr / Cumulative</u>
Subtotal	\$257,765.94 / \$1,301,488.21
Indirect Costs	\$ 53,854.62 / \$ 221,594.82
Total:	\$311,620.56 / \$1,523,083.03

10. Comments on administrative and logistical matters.

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11. Use additional page(s), as necessary, to describe scientific progress for the quarter in terms of the tasks or objectives listed in the statement of work for this agreement. Explain deviations where this isn't possible. Include date where possible. **SEE ATTACHED**

12. Use additional page(s) to present a brief statement of plans or milestones for the next quarter. **SEE ATTACHED**

I certify to the best of my knowledge and belief that this report is true in all respects and that all disbursements have been made for the purpose and conditions of the grant or agreement.

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Associate Project Director	Stanley Saiki, M.D.	50%	02/01/99
Project Manager	Jana Hall, Ph.D.	100%	01/04/99
Administrative Secretary	Irene Tanaka	100%	05/26/99
Administrative Officer (Fiscal)	Susan Iwanaga, B.B.A.	100%	04/01/99
Chief Technical Officer	David Huhta, MBA	100%	06/21/99
Systems Programmer	Mike von Platen	100%	08/02/99
Director, Telemed Learning Lab	Dan Davis, M.D.	10%	02/01/99
Curriculum Assessment & Eval	David C. Bangert, Ph.D.	40%	11/01/98
Curriculum Assessment & Eval	Robert Doktor, Ph.D.	30%	01/01/99
Associate Director (Audiology)	James Yates, Ph.D.	50%	05/16/00
Audiologist	Kathleen Campbell	100%	01/01/00
Telemedicine Clinic Coordinator	RaeAnn Magyar, M.D.	50%	03/13/00

Item #11: Description of Progress, May – July, 2000

Activities:

Deliverable:

Completed deliverable "Plan for Evaluation of UH Telemedicine Curriculum" - **attached**

Curriculum:

Attended "Advance Telemedicine Training" course, The Telemedicine Center, Brody School of Medicine, East Carolina University, May 1-5.

Attended American Telemedicine Association conference, Phoenix, Arizona, May 21-24.

Convened National Advisory Committee meeting at ATA conference, May 22; presented progress report and invited input re curriculum.

Participants:

Major General John Parker, M.D.
Eric Hanson
Jan Patterson
Danny Laspe
Rufus Sessions, Ph.D
COL Harrison Hassell
Major Catherine Beck

LTC Ron Poropatich, M.D.
Conrad Clyburn
James Bates, Ph.D.
LTC Rosemary Nelson
Richard Bakalar, M.D.
C. Forrest Faison, III
COL Alan Mease, M.D.

Conducted Hawaii Advisory Committee meeting, June 5 and invited input re curriculum.

Conducted two video-teleconferences with AMD on peripherals use and training for incorporation into curriculum, June 28 and 30.

Revised / edited curriculum content as per input from Advisory Committee members, others.

Initiated production of "Balance Assessment" module, San Diego, June 24-27.

Conducted video interviews for curriculum content:

COL Mease, COL Hassell, Major Mogel, Dr. Logan, LTC Nelson, MG Adams, RADM Wright

Attended course on Macromedia Director (web multimedia production application) in preparation for in-house production of modules.

Finalized web server technology selection; began programming prototypes of server applications.

Programmed prototype curriculum web page layout; scripting/programming languages for production.

Clinical Telemedicine Service Network:

Provided ongoing support, technical assistance for clinical service network.

Developed Veteran's Administration as potential second hub of specialists for clinical network.

Participated in Strong Angel/RIMPAC disaster response exercise as test call site.

Completed link to Maui Community College; remote training in process.

Continued work on prototype of distance auscultation system using IP connections and streaming video media technologies; field testing in August.

Distance Education:

Broadcast Grand Rounds weekly.

Extended Grand Rounds distance learning to three hospitals: Kuakini, Molokai General, St. Francis

Distributed Pediatrics and Medicine Grand Rounds over State Telehealth Access Network (STAN).

Provided technical assistance to University of Hawaii John A. Burns School of Medicine / AHEC's regarding videoconference network connections for distance medical education (fulfills plan to bring Biomed Building onto UH Telemedicine Project network; connections installation in August).

Administrative:

Initiated shift of two (2) staff positions from JABSOM to RCUH so all personnel are within one system.

Presented Poster Session at ATA Conference, "University of Hawaii Telemedicine Project," May 22, 2000.

Provided site visit of telemedicine hub (Queen Emma Clinics) to Lieutenant Colonel Rosemary Nelson, June 30.

Submitted to Telemedicine Journal for publication, "Implementing Store-and-Forward Telemedicine: Organizational Issues" - David Bangert, Ph.D. and Robert Doktor, Ph.D.

Contributed to formation of Hawaii Chapter of American Telemedicine Association.

Received formal letter of invitation to submit Renewal proposal to TATRC, June 1.

Requested No-Cost Extension from TATRC.

Presented lecture to Asia Pacific Nurses conference, "UH Telemedicine Project."

EIGHTH QUARTER ACTIVITIES

(August, 2000 - October, 2000)

Quarterly Report

1. Agreement No. DAMD17-99-2-9003 2. Report Date November 21, 2000
3. Reporting period from August 1, 2000 to: October 31, 2000
4. PI Richard B. Friedman, M.D. 5. Telephone No. (808) 528-2938
6. Institution University of Hawaii, Office of Research Services
2350 Dole Street, Sakamaki D-200, Honolulu, Hawaii 96822
7. Project Title: University of Hawaii Telemedicine Curriculum Project
8. Current staff, with percent effort of each on project. **SEE ATTACHED**
9. Agreement expenditures to date (as applicable):

	<u>This Qtr / Cumulative</u>		<u>This Qtr / Cumulative</u>
Personnel	\$157,543.68 / \$811,698.68	Travel	\$ 18,529.28 / \$ 41,362.32
Fringe Benefits	\$ 21,976.81 / \$134,617.35	Equipment	\$ 0.00 / \$214,577.75
Supplies	\$ 11,650.16 / \$108,320.00	Other	\$ 59,009.97 / \$259,622.01

	<u>This Qtr / Cumulative</u>
Subtotal	\$268,709.90 / \$1,570,198.11
Indirect Costs	\$ 54,816.81 / \$ 276,411.63
Total:	\$323,526.71 / \$1,846,609.74

10. Comments on administrative and logistical matters.

University of Hawaii serves as fiduciary agency for this Cooperative Agreement. Consequently, all expenditures and activities are governed by University of Hawaii policies and procedures as per the Office of Research Services and School of Medicine Administrative Services Fiscal Office.

11. Use additional page(s), as necessary, to describe scientific progress for the quarter in terms of the tasks or objectives listed in the statement of work for this agreement. Explain deviations where this isn't possible. Include date where possible. **SEE ATTACHED**

12. Use additional page(s) to present a brief statement of plans or milestones for the next quarter.

SEE ATTACHED

I certify to the best of my knowledge and belief that this report is true in all respects and that all disbursements have been made for the purpose and conditions of the grant or agreement.

Item #8: Current Staff**8th Quarter, August – October, 2000**

Responsibility	Individual	FTE	Effective
Principal Investigator	Richard Friedman, M.D.	20%	04/01/99
Associate Project Director	Stanley Saiki, M.D.	50%	02/01/99
Project Manager	Jana Hall, Ph.D.	100%	01/04/99
Administrative Secretary	Irene Tanaka	100%	05/26/99
Administrative Officer (Fiscal)	Susan Iwanaga, B.B.A.	100%	04/01/99
Chief Technical Officer	David Huhta, MBA	100%	06/21/99
Systems Programmer	Mike von Platen	100%	08/02/99
Director, Telemed Learning Lab	Dan Davis, M.D.	10%	02/01/99
Curriculum Assessment & Eval	David C. Bangert, Ph.D.	40%	11/01/98
Curriculum Assessment & Eval	Robert Doktor, Ph.D.	30%	01/01/99
Associate Director (Audiology)	James Yates, Ph.D.	50%	05/16/00
Audiologist	Kathleen Campbell	100%	01/01/00
Telemedicine Clinic Coordinator	RaeAnn Magyar, M.D.	50%	03/13/00

Item #11: Description of Progress, August – October, 2000

Activities:

Curriculum:

Finalized content and editing of Module 1: Telemedicine Fundamentals

Finalized content and editing of Module 2: Telemedicine Technology and Environment

Finalized content and editing of Module 3: Conducting a Telemedicine Visit

Finalized content and editing of Module 4: Organization and Management of Telemedicine

Drafted content of Module 5: Clinical Telemedicine Consult Simulations

Finalized content of Module 6: Telemedicine Applied: Balance Assessment / Audiology

Selected narrator, web design expertise; began photography, database programming.

Administrative:

Presented lecture / demonstration about University of Hawaii Telemedicine Project to United States Senator Daniel K. Inouye.

Presented lecture on University of Hawaii Telemedicine Project at 7th Annual Region IX Clinical Directors Management Training Conference.

Presented lecture on University of Hawaii Telemedicine Project at Shriners Hospital Telehealth Symposium.

Provided technical expertise to architects designing new UH medical school campus.

Provided expertise re medical privacy to State of Hawaii Legislative Task Force.

Received no-cost extension for Cooperative Agreement through March 31, 2001.

Cooperative Agreement Renewal Proposal drafted and forwarded to Dr. Rufus Sessions for review and input.

Associate Project Director, Stanley Saiki, M.D., resigned effective October 1, 2000.

Project Manager, Jana Hall, Ph.D., resigned effective November 3; replacement, Sharee Pepper, Ph.D., hired effective December 4, 2000.

Hawaii Advisory Committee convened August 21, 2000.

NINTH QUARTER ACTIVITIES
(November, 2000 – January, 2001)

Quarterly Report

1. Agreement No. DAMD17-99-2-9003 2. Report Date February 28, 2001
3. Reporting period from November 1, 2000 to: January, 2001
4. PI Richard B. Friedman, M.D. 5. Telephone No. (808) 547-4420
6. Institution University of Hawaii, Office of Research Services
2530 Dole Street, Sakamaki D-200, Honolulu, Hawaii 96822
7. Project Title: University of Hawaii Telemedicine Curriculum Project
8. Current staff, with percent effort of each on project. **SEE ATTACHED**
9. Agreement expenditures to date (as applicable):

	<u>This Qtr / Cumulative</u>		<u>This Qtr / Cumulative</u>
Personnel	\$119,059.84 / \$930,758.52	Travel	\$ 11,580.73 / \$ 52,943.05
Fringe Benefits	\$ 15,510.66 / \$150,727.41	Equipment	\$ 0.00 / \$214,577.75
Supplies	\$ 10,783.28 / \$119,755.85	Other	\$ 49,489.32 / \$309,111.33

	<u>This Qtr / Cumulative</u>
Subtotal	\$206,423.83 / \$1,777,873.91
Indirect Costs	\$ 42,110.46 / \$ 318,777.49
Total:	\$248,534.29 / \$2,096,651.40

10. Comments on administrative and logistical matters.

University of Hawaii serves as fiduciary agency for this Cooperative Agreement. Consequently, all expenditures and activities are governed by University of Hawaii policies and procedures as per the Office of Research Services and School of Medicine Administrative Services Fiscal Office.

11. Use additional page(s), as necessary, to describe scientific progress for the quarter in terms of the tasks or objectives listed in the statement of work for this agreement. Explain deviations where this isn't possible. Include date where possible. **SEE ATTACHED**

12. Use additional page(s) to present a brief statement of plans or milestones for the next quarter.
SEE ATTACHED

I certify to the best of my knowledge and belief that this report is true in all respects and that all disbursements have been made for the purpose and conditions of the grant or agreement.

Item #8: Current Staff**9th Quarter, November, 2000 – January, 2001**

Responsibility	Individual	FTE	Effective
Principal Investigator	Richard Friedman, M.D.	20%	04/01/99
Project Manager (resigned 12/31/00)	Jana Hall, Ph.D.	100%	01/04/99
Project Manager	Sharee Pepper, Ph.D.	100%	12/04/00
Administrative Secretary	Irene Tanaka	100%	05/26/99
Administrative Officer (Fiscal)	Susan Iwanaga, B.B.A.	100%	04/01/99
Chief Technical Officer	David Huhta, MBA	100%	06/21/99
Systems Programmer	Mike von Platen	100%	08/02/99
Curriculum Assessment & Eval	David C. Bangert, Ph.D.	40%	11/01/98
Curriculum Assessment & Eval	Robert Doktor, Ph.D.	30%	01/01/99
Audiologist	Kathleen Campbell	100%	01/01/00

Item #11: Description of Progress, November, 2000 – January, 2001

Administrative/Other Activities:

Project Manager, Jana Hall, Ph.D., resigned effective December 31; replacement, Sharee Pepper, Ph.D., hired effective December 4, 2000.

Two abstracts (1 poster and 1 presentation) accepted for Annual ATA meeting in June.

Staff members attended Telecon 2000 conference and exhibition, Anaheim, CA , December 5 – 9, 2000. Jana Hall, Project Manager, David Huhta, Chief Technical Officer and Mike von Platen, Systems Programmer were honored with the First Place - Telemedicine Application, Nineteenth Annual Telecon Award.

Coordinated weekly Grand Rounds broadcast from Queen's Medical Center to multiple sites throughout Hawaii. Regular participants include several Community Health Centers, the Hawaii Veterans Affairs and residents at the St. Francis Medical Center.

Hosted five member delegation from Okinawa from 1/9 -11/01 for overview of Telemedicine in Hawaii. The delegation met with the Japanese Consulate, followed by visits to St. Francis Medical Center, Kuakini Medical Center, Shriners Hospital for Children, Department of Veterans Affairs (Tripler Army Medical Center), and the Queen's Medical Center. Special telemedicine related tours and demonstrations were also provided by the UH Telemedicine Office, Kapi'olani Medical Center, PEACESAT, and the UH School of Medicine where they met with Dean Edwin Cadman. One of the main purposes of their visit was to share information regarding the use of IT for medical services in remote islands and rural areas which are similar in nature to the problems being solved in Hawaii. The delegation was led by Seishiro Miyagi, M.D., Ph.D., Clinical Professor of Medicine, Director & Chief of Medicine, Ryukyu University School of Medicine and Chuba Hospital, who indicated that he would strongly encourage a telemedicine system be set up throughout the Pacific region with cooperation from Hawaii.

Initiated new clinical consultation service: diabetes case management. Dr. Joseph Humphry has been conducting biweekly telemedicine consults with the Hana Community Health Center on Maui, from the UH Telemedicine Project facilities for several months. In January, Dr. Pepper attended a workshop on community based diabetes treatment and telemedicine training in Hana conducted by Dr. Humphry.

Provided technical support for startup of School of Medicine Distance Learning Initiative. (Interactive group sessions among students on various Hawaiian islands via videoconference technology.)

Began discussions with physicians in Guam regarding possible telemedicine connections for clinical consultation and distance learning during the project renewal period. Telemedicine connectivity to Guam has the potential to provide realistic curriculum testing and evaluation simulating remote military telemedicine requirements.

Began discussions with representatives of the Molokai General Hospital in preparation for establishing telemedicine connectivity to the Queen's Medical Center and Queen Emma Clinics, for clinical consultations and distance education during the project renewal period.

Prepared curriculum samples for TATRC SITREP briefing (1/8/01), per request by Dr. Sessions.

Transition to Research Corporation of the University of Hawaii (RCUH), as administrative agency for all purchasing and personnel matters. Dr. Pepper and Ms. Tanaka have attended a number of RCUH workshops to learn new policy, procedures and computer data entry. Since this system is entirely web based the position of Administrative Officer (Fiscal), currently filled by Ms. Susan Iwanaga, will be eliminated.

Analyzed unexpended equipment budget; investigated potential purchases in relation to project renewal activities.

Draft Cooperative Agreement Renewal Proposal submitted to Mr. Danny Laspe.
USAMRAA/TATRC.

Curriculum Related Activities:

Established public web server on the University of Hawaii network to host the Telemedicine Curriculum during the remaining production phases.

Posted Modules 1-3 to public web server for evaluation by advisory group. (Password-protected).

Summary: Work during this period focused on the production of the curriculum deliverable. This entailed programming of web pages and website structure; production of graphics; digital photography and image editing; digital video recording and editing; processing of photos and video for web delivery (compression); and similar related activities.

Substantially completed production of Module 1: Telemedicine Fundamentals.
Minor punchlist items remaining.

Substantially completed production of Module 2: Telemedicine Technology and Environment. Minor punchlist items remaining.

Substantially completed production of Module 3: Conducting a Telemedicine Visit.
Minor punchlist items remaining.

Posted Modules 1-3 to public web server for evaluation by advisory group. (Password-protected).

Recorded narrator for sound clips for Module 4: Organization and Management of Telemedicine.

Produced visual elements for Module 4: Organization and Management of Telemedicine. Includes video editing/compression and sound clips for multimedia presentation of module content. This module will be completed in the next quarter.

Worked on structure for Module 5: Clinical Telemedicine Consult Simulations.

Refined content for Module 6: Telemedicine Applied: Balance Assessment/Audiology.

Began producing visual elements for Module 6, including photographs and digital video clips.

Managed and directed the work of contractor: graphic design, page layout design, Flash elements, Quicktime video clips.

Modules 1 - 3 content, general web page design and presentation were reviewed and critiqued by Sean Thomas, M.D., Indiana University School of Medicine. Dr. Thomas is a webmaster with special expertise in medical web design.

TENTH INTERIM REPORT
(February, 2001 – May, 2001)

Interim Report

1. Agreement No. DAMD17-99-2-9003 2. Report Date July 2, 2001
3. Reporting period from February, 2001 to: May, 2001
4. PI Richard B. Friedman, M.D. 5. Telephone No. (808) 547-4420
6. Institution University of Hawaii, Office of Research Services
2530 Dole Street, Sakamaki D-200, Honolulu, Hawaii 96822
7. Project Title: University of Hawaii Telemedicine Curriculum Project
8. Current staff, with percent effort of each on project. **SEE ATTACHED**
9. Agreement expenditures to date (as applicable):

	<u>This Qtr / Cumulative</u>		<u>This Qtr / Cumulative</u>
Personnel	\$107,030 / \$1,037,789	Travel	\$ 2,559 / \$ 55,503
Fringe Benefits	15,456 / \$165,586	Equipment	\$ 9,052 / \$223,629
Supplies	7,016 / \$126,121	Other	\$ 28,233 / \$337,347

	<u>This Qtr / Cumulative</u>
Subtotal	\$169,357 / \$1,945,975
Indirect Costs	\$ 32,701 / \$ 351,224
Total:	\$202,059 / \$2,297,206

10. Comments on administrative and logistical matters.

University of Hawaii serves as fiduciary agency for this Cooperative Agreement. Consequently, all expenditures and activities are governed by University of Hawaii policies and procedures as per the Office of Research Services and School of Medicine Administrative Services Fiscal Office.

11. Use additional page(s), as necessary, to describe scientific progress for the quarter in terms of the tasks or objectives listed in the statement of work for this agreement. Explain deviations where this isn't possible. Include date where possible. **SEE ATTACHED**

12. Use additional page(s) to present a brief statement of plans or milestones for the next quarter.
SEE ATTACHED

I certify to the best of my knowledge and belief that this report is true in all respects and that all disbursements have been made for the purpose and conditions of the grant or agreement.

Item #8: Current Staff**10th Quarter, February - May, 2001**

Responsibility	Individual	FTE	Effective
Principal Investigator	Richard Friedman, M.D.	20%	04/01/99
Project Manager	Sharee Pepper, Ph.D.	100%	12/04/00
Administrative Secretary	Irene Tanaka	100%	05/26/99
Chief Technical Officer	David Huhta, MBA	100%	06/21/99
Systems Programmer	Mike von Platen	100%	08/02/99
Clinician	Joseph Humphry, M.D.	10%	04/01/01
Clinical Associate	Daniel Saltman, M.D.	10%	04/01/01

Item #11: Description of Progress, February - May, 2001

Curriculum Related Activities:

Updated public web server on the University of Hawaii network to host the Telemedicine Curriculum at <http://www.uhtelemed.hawaii.edu/curriculum>.

Posted Modules 1-6 to public web server for evaluation and feedback by advisory boards, TATRC staff, and all interested parties.

Work during this period focused on the completion of the curriculum deliverable. This entailed programming of web pages and website structure; production of graphics; digital photography and image editing; digital video recording and editing; processing of photos and video for web delivery (compression); and similar related activities

A posters by Dr. Stan Saiki (Training Telemedicine Consultants) and a talk by Dr. Sharee Pepper (A Web-Based Telemedicine Curriculum) were presented at the Annual ATA conference, held in Ft Lauderdale, FL on June 3-6, 2001 (see attached abstracts). Dr. David Bangert also made a poster presentation (Best Practices for High Utilization of Telemedicine). Dr. Pepper demonstrated the UHTP Curriculum Modules on Monday and Tuesday (5/3 & 4) in the TATRC display area.

Administrative and Other Activities:

Coordinated weekly Grand Rounds broadcast from Queen's Medical Center to multiple sites throughout Hawaii.

Continuing clinical consultation service: diabetes case management. Dr. Joseph Humphry conducts biweekly telemedicine consults with the Hana Community Health Center on Maui, from the UH Telemedicine Project facilities and Queen Emma Clinic.

Dr. Pepper and Ms. Tanaka attended four RCUH (Research Corp. of the UH) workshops related to transferring administrative services from the UH to the RCUH computerized systems.

Video teleconference with Guam Memorial Hospital staff on 04/24/01. Agenda included possible participation in UH School of Medicine Grand Rounds, CME credits, JCAHO accreditation assistance, possible clinical consultations and technical problems/barriers.

UHTP Advisory Committee met on April 16, 2001. Agenda included presentation of curriculum modules and clinical applications update (see attachments I & II).

Dr. Pepper visited five Community Health Centers and clinics on the Big Island regarding possible clinical telemedicine applications and feedback on curriculum modules.

Received TATRC reviewers comments and staff summary of 2/16 Renewal Proposal on 5/11/01.

Resubmitted revised Renewal Proposal in response to reviewers/staff comments on 5/22/01.

Attachment I

Training Telemedicine Consultants

Stan Saiki, M.D., David Huhta, Michael VonPlaten, Jana Hall, Ph.D., Richard Friedman, M.D.,
University of Hawaii School of Medicine, Honolulu, HI

Clinician buy-in and investment is central to the success of any telemedicine system. Clinicians must be comfortable that findings achieved during a telemedicine consultation are the same as those that would occur during a real-time face to face encounter.

The University of Hawaii Telemedicine Group has developed a telemedicine orientation program held within a clinical laboratory environment. The program places the clinicians and other members of the telemedicine team in "orientation" clinical encounters. Telemedicine sending and receiving systems are set up in different rooms within the clinical laboratory. Trainees playing the role of "consultants" are located in the consultation room. They practice their skills at communicating over telecommunications links, assessing clinical information provided by the telemedicine peripheral devices and directing extenders in the examination room to assist in the examination of "standardized patients". Upon completing the teleconsultation the trainee moves into the examination room with the "patient" to confirm that his or her impression over the telecommunications links are validated in the face-to-face visit.

Most participants require only two or three such exercises to become comfortable using the technologies. Disciplines such as psychiatry, where there is less physical contact with patients, predictably require less training. Disciplines, such as cardiology and gastroenterology, which require more intensive use of telemedicine peripherals, require more training time.

Attachment II

A Web-Based Telemedicine Curriculum

Richard Friedman, M.D., Sharee Pepper, Ph.D., Stan Saiki, M.D., David Huhta, Michael vonPlaten, University of Hawaii School of Medicine, Honolulu, HI

A web-based, multimedia curriculum designed to train health care providers in the use of telemedicine was developed by University of Hawaii Telemedicine Program under a cooperative agreement with Department of Defense. The curriculum includes five modules:

- 1 Telemedicine Fundamentals
- 2 Telemedicine Technology & Environment
- 3 Conducting a Telemedicine Patient Visit
- 4 Organization & Management of Telemedicine Encounters
- 5 Clinical Telemedicine Consult Simulations

The curriculum includes over 20 hours of content with cross linkages among the various modules and extensive links to Internet sites. The user's movement through the curriculum is self-directed. A unique aspect of the curriculum is module five in which the trainee is presented with a clinical scenario for a telemedicine consultation. The user selects various attributes for the telemedicine encounter (bandwidth, lighting, room acoustics, video camera, etc.) and then views that actual encounter. An expert critique is presented at the end of this viewing and the user may then reconfigure the interaction using this information. The student is also able to view and manipulate various telemedicine devices (ophthalmoscope, stethoscope, general exam camera, video camera, etc.) using software which "stitches" a series of still photos of these devices into a seamless 3D object model.